

Component II: Community Types of Greatest Conservation Need

“This is a high-leverage strategy to address the conservation concerns of whole ecological communities or species groupings. Implementing conservation strategies at this level will comprehensively benefit many fish and wildlife species.”

Fish and wildlife communities have not been formally defined for Montana’s complex biological systems. For this Strategy, landscape characteristics, vegetative cover type, and associated fish and wildlife species were linked in order to begin describing community types. Future efforts to provide complete classifications of Montana’s fish and wildlife communities will be critical for implementing this Strategy and monitoring conservation success.

Conservation at the community level provides the potential to leverage conservation resources to benefit large numbers of species. Community types also provide a way to associate numerous species through common habitat requirements. These communities of plants and animals often face similar conservation concerns that can be addressed simultaneously. In the focus area component of this Strategy, geographic areas were identified that offer some of the greatest potential to conserve the community types and species in greatest need of conservation. The following community types have been identified as Tier I (in greatest need of conservation, with a status of low or declining), and efforts to conserve them should not be limited to the focus areas identified in Component I. Efforts should be made to address the conservation strategies identified for these community types across the state regardless of where they occur.

Grassland Complexes (31,551,627 acres or 33.53% of Montana)

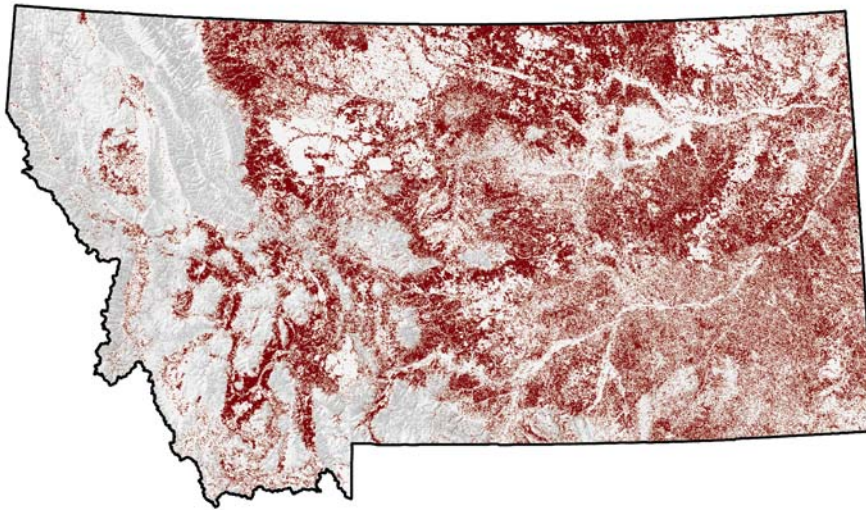


Figure 36. Distribution of Grassland Community Types

Grassland communities occur in broad western mountain valleys, high mountain meadows, and on the plains of eastern Montana. Very low to high cover grasses are characteristic of these areas, and this array of grass types is found in open lands, often interspersed among shrubs. This community type is essentially associated with more terrestrial species in greatest need of conservation than any other community type in Montana.

Grassland habitats are difficult to meaningfully differentiate using only remotely sensed data like the GAP mapping. Types based on the relative cover of grass are not ecologically based or directly related to habitat conditions. Descriptions of GAP grassland types are very broad and include some species that are not common in Montana or do not occur together. A classification and mapping system that incorporates ecological data and is associated with a recognized vegetation classification like the National Vegetation Classification System will have greater management applicability in the future and should be supported.

Three main categories of grassland complexes are found throughout Montana. Very low cover grasslands occur primarily in central and eastern Montana valleys. These grasslands range from semi-desert grasslands with total grass cover from 10 to 30 percent to grasslands dominated by short grasses and forbs that have high amounts of bare soil (20 to 60 percent cover). Very low cover grasslands have production ranges from 50 to 300 pounds per acre and are usually associated with alkaline soils and/or disturbed sites.

Low to moderate cover grasslands occur across the state in valleys and foothills, on middle to high-elevation mountain slopes on south aspects. Low to moderate cover grasslands have total grass cover from 20 to 70 percent and are

dominated by short- to medium-height grasses and forbs, with production ranges from 300 to 1,800 pounds per acre. These grasslands include rangelands and non-irrigated pastures.

Moderate to high cover grasslands include total grass cover from 50 to 100 percent. They are dominated by medium to tall grasses in prairie areas. Moderate to high cover grasslands have production ranges from 1,000 to 7,000 pounds per acre and are usually associated with wet sites.

Essential Associated Plant Community

Arrowleaf Balsamroot (*Balsamorhiza sagittata*)
Big Bluestem (*Andropogon gerardii*)
Bluebunch Wheatgrass (*Agropyron spicatum*)
Blue grama (*Bouteloua gracilis*)
Bluestem (*Andropogon* spp.)
Carex species (*Carex* spp.)
Clubmoss (*Selaginella densa*)
Elk Sedge (*Carex gereyi*)
Green Needlegrass (*Stipa viridula*)
Hood's Phlox (*Phlox hoodii*)
Idaho Fescue (*Festuca idahoensis*)
Indian grass (*Sorghum nutans*)
Little Bluestem (*Andropogon scoparium*)
Lupine (*Lupinus* spp.)
Missouri Goldenrod (*Solidago missouriense*)
Needle-and-Thread grass (*Stipa comata*)
Prairie June grass (*Koeleria* spp.)
Prairie Sandreed (*Calamovilfa longifolia*)
Rough Fescue (*Festuca scabrella*)
Sandberg's bluegrass (*Poa sandbergii*)
Sun Sedge (*Carex heliophila*)
Switchgrass (*Panicum virgatum*)
Threadleaf Sedge (*Carex filifolia*)
Timothy (*Phleum pratensis*)
Western Wheatgrass (*Agropyron smithii*)

Associated Species of Greatest Conservation Need (Tier I Species)

There are a total of 358 terrestrial vertebrate species that are found within the grassland complexes community type, with 199 of these species being essentially associated (essentially associated species are shown in bold). All associations can be found in Table 39.

Amphibians: Northern Leopard Frog

Reptiles: Western Hog-nosed Snake, Milksnake, and Smooth Greensnake

Birds: Trumpeter Swan, Greater Sage-Grouse, Columbia Sharp-tailed Grouse, Yellow Rail, Whooping Crane, Piping Plover, Mountain Plover, Long-billed Curlew, Black Tern, Burrowing Owl, Sedge Wren, and Nelson's Sharp-tailed Sparrow

Mammals: Spotted Bat, Townsend's Big-eared Bat, Pallid Bat, Black-tailed Prairie Dog, White-tailed Prairie Dog, Great Basin Pocket Mouse, Meadow Jumping Mouse, Grizzly Bear, Black-footed Ferret, and American Bison

Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
Spread of noxious weeds and non-native plants, especially knapweed, leafy spurge, and cheatgrass	Prevent the introduction and spread of noxious weeds on existing tracts of palouse prairie
	Maintain the appropriate native species composition using resource management strategies
	Restore areas infested with the highly flammable, invasive cheatgrass, returning them to native grasses and forbs
	Create a stable native seed source for grass restoration
Impacts from oil, gas, geothermal, and coal extraction and development	Monitor leasing and development decisions and regulations applying to geophysical exploration
	Work with corporations, land owners and other agencies to reduce impacts of exploration
	Education and research on fossil fuel development and its impacts on natural landscape
	Conduct research to determine impacts from petroleum exploration and extraction activities
Impacts from un-managed recreational use	Work with the public and other agencies to establish sustainable recreation management practices, including designations of lands open, limited, or closed to off-road vehicle use

Fragmentation and habitat loss due to agricultural and subdivision development	Promote incentives and education for private landowners to protect natural habitat
	Support strategic conservation easements by conservation organizations and public agencies to provide large blocks of short grass types in a diverse mosaic of habitats
	Identify and prioritize key wildlife linkage areas, and work with other state and federal agencies, conservation groups, and landowners to restore wildlife connectivity
	Support state/federal tax incentives that discourage habitat fragmentation
	Promote further development of county ordinances that help guide future residential and commercial development
	Maintain vertical and horizontal soil structure on existing public tracts by developing appropriate resource management strategies
Range or forest management practices	Support government and private conservation activities that encourage and support sustainable land management practices (example; rest and rotation schedules)
Loss of natural fire disturbance	Work with public and private activities to re-establish natural fire regime
Lack of sufficient habitat cover data layers	Support cooperative efforts to develop up to date, comprehensive habitat cover layers

References

Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, MT.

Conservation Management of America's Public Lands: An Assessment and Recommendations for Progress 25 Years after FLPMA. 2001. National Wildlife Federation and the Natural Resources Defense Council.

Ostlie, W. R., R. E. Schneider, J. M. Aldrich, T. M. Faust, R. L. B. McKim, and S. J. Chaplin. 1997. The status of biodiversity in the Great Plains. The Nature Conservancy, Arlington, VA. 326 pp + XII.

Statewide Habitat Plan. 1994. Implementation of Fish, Wildlife & Parks Commission. Habitat Montana Policy.

Mixed Broadleaf Forests (883,498 acres or 0.94% of Montana)



Figure 37. Distribution of Mixed Broadleaf Forest Community Types

Aspen Galleries

Galleries often occur within grassland openings or along the border between grassland openings and coniferous forests. When mature, these galleries often support native tall-grass or mixed-grass prairie plants. When occurring in lowland areas, they are often home to wet meadow species or may contain small wetlands. Sunlight passes easily through the canopy of healthy, mature aspen galleries, promoting understory growth of a rich variety of grasses, wildflowers and sometimes shrubs. In combination, this complex of trees, grasses, and shrubs provide unique foods (including seeds, berries, or nuts) for an equally diverse array of wildlife.

Woody Draws

Draws are a prominent feature across eastern Montana. A much drier, upland environment often surrounds these more diverse dry streambed type areas. Water is not present long enough each year in order to classify them as a wetland, but they are characterized by a greater diversity and density of vegetation that serves a similar function. Woody draws provide essential cover, food, and water for many wildlife species in eastern Montana that otherwise would not exist. Draws are ribbons of life that support some of the highest concentrations of wildlife in the area. Information exists that indicates woody draws are declining throughout the northern Great Plains (Lesica 2005). Conserving these draws will depend on the success of green ash, the dominant plant species in most stands.

Essential Associated Plant Community

Aspen (*Populus tremuloides*)
Birch (*Betula* spp.)
Bur Oak (*Quercus macrocarpa*)
Green Ash (*Fraxinus pennsylvanica*)
Plains Cottonwood (*Populus deltoides*)

There are a total of 26 terrestrial vertebrate species that are found within the mixed broadleaf forest community type, with 5 of these species being essentially associated. All associations can be found in Table 40. Note: Wildlife associations within the mixed broadleaf forest community type were underestimated due to unresolvable issues. This should be considered when interpreting species associations with mixed broadleaf forest in this Strategy. Future revisions should clarify and resolve these wildlife associations with the mixed broadleaf forest community type.

Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
All Broadleaf Forests	
Loss of broadleaf forest habitat due to rangeland and forest management practices, clearing for agricultural use, and impacts related to human population growth	Work with agency and private land conservation efforts to place easements on lands and implement resource management for aspen galleries, cottonwood forests and woody draws
	Promote incentives and education for private landowners to protect all three broadleaf forest types
	Work with other agencies, organizations and private land owners to develop best management principals for broadleaf forests
	Work with local governments to support growth and development plans that recognize the importance of broadleaf forests
	Support education efforts to inform the public concerning the critical need for conserving broadleaf forests
	Develop statewide riparian best management principles

Aspen Galleries	
Altered natural fire regime in aspen galleries (increases encroachment of conifers)	Work with other agencies of authority to re-establish natural fire regime to promote aspen gallery health
Woody Draws	
Loss of mature snags in woody draw areas	Promote public education of the need to preserve older snags in woody draws
	Support initiatives to reestablish and maintain green ash in woody draws
Loss of shrub layers and lack of overstory recruitment due to range management practices in woody draws	Work with public and private landowners to provide incentives for sustainable management
	Work to develop best management principals for woody draw habitats

References

- Bartos, Dale L., and Robert B. Campbell. February 1998. Decline of Quaking Aspen in the Interior West—Examples from Utah. *Rangelands*. Vol. 20, No. 1.
- Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, MT.
- Elis, Janet H., and Jim Richard. A planning guide for protecting Montana's wetlands and riparian areas. Montana Watercourse, Montana Department of Environmental Quality and Montana Audubon Society.
- Hansen, A., J. Rotella, L. Klass, and D. Gyskiewicz. 2003. Riparian Habitat Dynamics and Wildlife Along the Upper Yellowstone River. Technical Report #1. Landscape Biodiversity Lab, Montana State University, Bozeman, MT. In cooperation with the Governor's Upper Yellowstone River Task Force.
- Kootenai Tribe of Idaho and Montana Fish, Wildlife & Parks. 2004. Public Review Draft Kootenai Subbasin Plan. Executive Summary. Report prepared for the Northwest Power and Conservation Council. Portland, OR.
- Lesica. 2005. Restoring green ash regeneration from seed in declining hardwood draws. Unpublished report.
- Statewide Habitat Plan. 1994. Implementation of Fish, Wildlife & Parks Commission. Habitat Montana Policy.

Mixed Shrub/Grass Associations (4,159,693 acres or 5.34% of Montana)

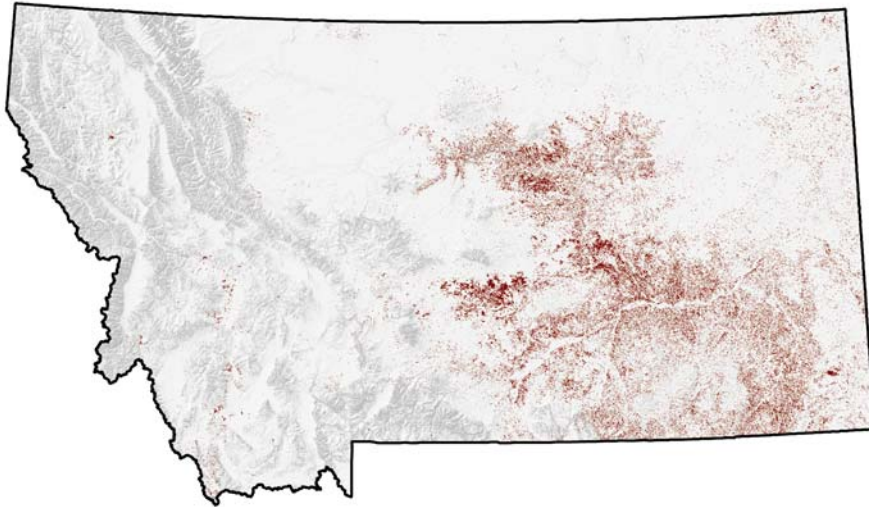


Figure 38. Distribution of Mixed Shrub/Grass Associations Community Types

The mixed shrub/grass associations community types include the shrub-dominated areas that also support grass. These types can be either moist (mesic) or dry (xeric) but usually occur at low elevation and often along lower slopes. These communities are the transition between pure shrub and grass communities and support a very unique assembly of associated species.

Mesic

Mesic occurs primarily in central and eastern Montana valleys and along some low mountain slopes. Mesic shrub-grassland associations occur with codominance between the shrub and grass species. Shrub and grass cover ranges from 10 to 50 percent. It is found on moist sites usually between pure grass- and shrub-dominated regions.

Essential Associated Plant Community

Grass

Bluebunch Wheatgrass (*Agropyron spicatum*)
Bluestem (*Andropogon* spp.)
Fescue (*Festuca* spp.)
Needle-and-Thread grass (*Stipa comata*)
Threadleaf Sedge (*Carex filifolia*)
Western Wheatgrass (*Agropyron smithii*)

Shrubs

Buffalo Berry (*Shepherdia argentea*)
Choke Cherry (*Prunus virginiana*)
Silver Sage (*Artemisia cana*)
Snowberry (*Symphoricarpos* spp.)
Sumac (*Rhus* spp.)

Xeric

Xeric occurs primarily in central and eastern Montana valleys and along some low mountain slopes. Xeric shrub-grassland associations occur with codominance between the shrub and grass species. Shrub and grass cover ranges from 10 to 50 percent. It is found on dry sites in valleys and is usually between grass-dominated and shrub-dominated regions.

Essential Associated Plant Community

Grass

Blue grama (*Bouteloua gracilis*)
Bluebunch Wheatgrass (*Agropyron spicatum*)
Bluestem (*Andropogon* spp.)
Fescue (*Festuca* spp.)
Needle-and-Thread grass (*Stipa comata*)
Western Wheatgrass (*Agropyron smithii*)

Shrubs

Rabbitbrush (*Chrysothamnus* spp.)
Sagebrush (*Artemisia* spp.)

Associated Species of Greatest Conservation Need (Tier I Species)

There are a total of 39 terrestrial vertebrate species that are found within the mixed shrub/grass associations community type, with 10 of these species being essentially associated (essentially associated species are shown in bold). All associations can be found in Table 41. Note: Wildlife associations within the mixed shrub/grass associations community type were underestimated due to unresolvable issues. This should be considered when interpreting species associations with mixed shrub/grass associations in this Strategy. Future revisions should clarify and resolve these wildlife associations with the mixed shrub/grass associations community type.

Reptiles: Western Hog-nosed Snake and **Milksnake**

Birds: Greater Sage-Grouse, Mountain Plover, and Burrowing Owl

Mammals: Spotted Bat and Black-tailed Prairie Dog

Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
Loss of habitat due to conversion of native habitat to agriculture or as a result of human population growth/development	Support private land easements that protect natural habitat to provide large blocks of a diverse mosaic of shrub/grass habitats
	Incentives and education for private landowners to protect natural habitat
	Support government and private conservation programs/activities that encourage and support private land stewardship
	Promote further development of county ordinances that help guide future residential and commercial development in mixed shrub grass habitat
	Identify and prioritize key wildlife linkage areas in this community, and work with other state and federal agencies, conservation groups, and landowners to restore wildlife connectivity
Invasive species and potential for spreading	Work with off-road vehicle users to help reduce spread of invasive weed
	Create a stable native seed source for shrubs and grass restoration
	Support cooperative efforts to reduce the abundance of exotic or invasive plant species
Oil, gas, coal, coal bed methane, and geothermal development	Monitor leasing and development decisions and regulations applying to geophysical exploration
	Research the impacts such as road building and water retention pond construction as they relate gas and oil development activities

Range or forest management practices	Support government and private conservation activities that encourage and support sustainable land management practices (example; rest and rotation schedules)
	Work with other agencies, organizations and private land owners to develop incentives that will promote the conservation of native shrub/grass habitats

References

Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, MT.

Conservation Management of America's Public Lands: An Assessment and Recommendations for Progress 25 Years after FLPMA. 2001. National Wildlife Federation and the Natural Resources Defense Council.

Ostlie, W. R, R. E. Schneider, J. M. Aldrich, T. M. Faust, R. L. B. McKim, and S. J. Chaplin. 1997. The status of biodiversity in the Great Plains. The Nature Conservancy, Arlington, VA. 326 pp + XII.

Riparian and Wetland (3,724,224 acres or 3.94% of Montana)

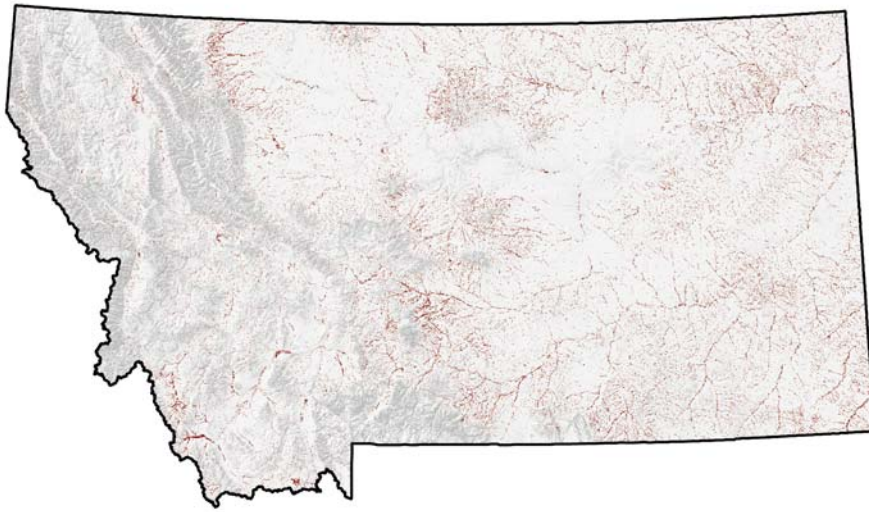


Figure 39. Distribution of Riparian and Wetland Community Types

Montana's riparian and wetland communities vary widely depending on the area of the state and elevation where they are located, but generally they represent the green zones along rivers, streams, lakes, and reservoirs and include potholes, wet meadows, marshes, and fens. This community type also includes the cottonwood forests that occur throughout Montana. Cottonwood stands develop in river and stream corridors on alluvial bars created by dynamic flows of spring runoff and mature into forests that eventually alter the direction of water flow. These stands, including Great Plains or black cottonwoods, help stabilize banks, keep waters cool in summer, and help their associated plants support diverse wildlife species. As a result of the adjacent water and diverse vegetation, these communities support the greatest concentration of plants and animals in Montana and serve as a unique transition zone between the aquatic and the terrestrial environments.

Riparian and wetland communities often occur as narrow linear bands or small depressions that are not recognized at the scale of the GAP mapping used in this analysis. More accurate and inclusive knowledge of riparian/wetland locations and types will be available if National Wetlands Inventory mapping or a similar product is completed for Montana. These types of efforts should be supported in order to improve future revisions of this Strategy.

Conifer Riparian

Conifer riparian occurs in riparian areas in western and south-central Montana. These are riparian areas dominated by conifer forest, with total tree cover from 20 to 100 percent. Associated shrub species include alder (*Alnus* spp.), red-osier dogwood (*Cornus stolonifera*), bunchberry (*Cornus canadensis*), willows (*Salix*

spp.), thimbleberry (*Rubus parviflorum*), and twin flower (*Linnaea borealis*). Associated grass and forb species include queens cup beadlily (*Clintonia uniflora*).

Essential Associated Plant Community

Douglas-fir (*Pseudotsuga menziesii*)
Engelmann Spruce (*Picea engelmannii*)
Grand Fir (*Abies grandis*)
Red-osier Dogwood (*Cornus stolonifera*)
Subalpine Fir (*Abies lasiocarpa*)
Western Hemlock (*Tsuga heterophylla*)
Western Red Cedar (*Thuja plicata*)

Broadleaf Riparian

Broadleaf riparian occurs in riparian areas across Montana. These are riparian areas dominated by broadleaf (cottonwood) forest, with total tree cover from 20 to 100 percent. Associated shrub species include alder (*Alnus* spp.), bunchberry (*Cornus canadensis*), serviceberry (*Amelanchier alnifolia*), thimbleberry (*Rubus parviflorum*), common chokecherry (*Prunus virginiana*), and willow (*Salix* spp.). Associated grass and forb species include queens cup beadlily (*Clintonia uniflora*) and carex (*Carex* spp.).

Essential Associated Plant Community

Aspen (*Populus tremuloides*)
Birch (*Betula* spp.)
Black Cottonwood (*Populus trichocarpa*)
Bur Oak (*Quercus macrocarpa*)
Green Ash (*Fraxinus pennsylvanica*)
Plains Cottonwood (*Populus deltoides*)

Broadleaf and Conifer Riparian

Broadleaf and conifer riparian occurs in riparian areas in western and south-central Montana. These are riparian areas dominated by mixed broadleaf (cottonwood) and conifer forest, with total tree cover from 20 to 100 percent. Associated shrub species include alder (*Alnus* spp.), bunchberry (*Cornus canadensis*), serviceberry (*Amelanchier alnifolia*), thimbleberry (*Rubus parviflorum*) and willow (*Salix* spp.). Associated grass and forb species include queens cup beadlily (*Clintonia uniflora*) and carex (*Carex* spp.).

Essential Associated Plant Community

Aspen (*Populus tremuloides*)
Birch (*Betula* spp.)
Black Cottonwood (*Populus trichocarpa*)
Grand Fir (*Abies grandis*)
Douglas-fir (*Pseudotsuga menziesii*)
Engelmann Spruce (*Picea engelmannii*)
Subalpine Fir (*Abies lasiocarpa*)
Western Larch (*Larix occidentalis*)
Western Hemlock (*Tsuga heterophylla*)
Western Red Cedar (*Thuja plicata*)

Graminoid and Forb Riparian

Graminoid and forb riparian occurs in riparian areas across the state. These are riparian areas dominated by herbaceous species, with total herbaceous cover from 30 to 100 percent. Riparian areas with tree and shrub cover comprise less than 15 percent. Standing water may be present in the riparian area (cattail marshes).

Essential Associated Plant Community

Baltic Rush (*Juncus balticus*)
Bluejoint Reedgrass (*Calamagrostis canadensis*)
Bog Sedge (*Carex rostrata*)
Cinquefoil (*Potentilla* spp.)
Cattails (*Typha* spp.)
Lake Sedge (*Carex lacustris*)
Maritime Sedge (*Carex incurviformis*)
Northern Reedgrass (*Calamagrostis inexpensa*)
Rushes (*Juncus* spp.)
Saxifrage (*Saxifraga* spp.)
Sedges (*Carex* spp.)
Tufted Hairgrass (*Deschampsia cespitosa*)

Shrub Riparian

Shrub riparian occurs in riparian areas across the state. These are riparian areas dominated by shrubs, with total shrub cover from 20 to 100 percent. Tree cover is less than 15 percent, and shrubs dominate over the herbaceous species. Standing water may be present in the riparian area (willow marshes).

Essential Associated Plant Community

Alder (*Alnus* spp.)

Black Hawthorn (*Crataegus douglasii*)
Bog Birch (*Betula glandulosa*)
Choke Cherry (*Prunus virginiana*)
Currant (*Ribes* spp.)
Red-osier Dogwood (*Corus stolonifera*)
Rose (*Rosa* spp.)
Shrubby Cinquefoil (*Potentilla fruticosa*)
Silver Sage (*Artemisia cana*)
Snowberry (*Symphoricarpos* spp.)
Thimbleberry (*Rubus parviflorum*)
Twin-berry (*Lonicera involucrata*)
Utah Honeysuckle (*Lonicera* spp.)
Water Birch (*Betula occidentalis*)
Willows (*Salix* spp.)

Mixed Riparian

Mixed riparian occurs in riparian areas across the state. These are riparian areas dominated by a mix of shrub and herbaceous species, with codominance of shrub and grass species present. Tree cover is less than 15 percent.

Essential Associated Plant Community

Grass species (see *Graminoid and Forb Riparian species*)
Shrub species (see *Shrub Riparian species*)

Associated Species of Greatest Conservation Need (Tier I Species)

There are a total of 265 terrestrial vertebrate species that are found within the riparian and wetland community type, with 196 of these species being essentially associated (essentially associated species are shown in bold). All associations can be found in Table 42. While the riparian and wetland community type comprises only 3.94 percent of Montana, it is critical to conservation. Seventeen of the 19 (89 percent) species of greatest conservation need found in the riparian and wetland community type are essentially associated.

Amphibians: Coeur d' Alene Salamander, Western Toad, and Northern Leopard Frog

Reptiles: Snapping Turtle, Spiny Softshell, and Western Hog-nosed Snake

Birds: Common Loon, Trumpeter Swan, Harlequin Duck, Bald Eagle, Yellow Rail, Piping Plover, Interior Least Tern, Black Tern, Sedge Wren, and Nelson's Sharp-tailed Sparrow

Mammals: Townsend's Big-eared Bat, Northern Bog Lemming, and Meadow Jumping Mouse

Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
All Riparian and Wetland	
Draining and conversion of wetlands to agricultural cropland and subdivisions	Work with other groups to identify riparian areas wetlands that are critically important to wildlife diversity and work toward protection and enhancement
	Work with local governments and organizations to address loss of riparian and wetland areas associated with residential development through riparian setbacks
	Develop statewide best management principals for Montana's riparian and wetland areas
Loss of riparian habitat due to streamside residential development	Support strategic conservation easements by conservation organizations and public agencies
	Develop statewide best management principals for Montana's riparian and wetland areas
Adjacent uplands effected by range and forest management practices	Support government and private conservation activities that encourage and support sustainable land management practices
	Develop statewide best management principals for Montana's riparian and wetland areas
Invasive or exotic plant species	Support efforts to eradicate exotic or invasive plant species
Lack of a GIS coverage of wetlands across Montana	Partner with other agencies to develop an up-to-date comprehensive wetland and riparian GIS coverage
	Support efforts to complete the National Wetlands Inventory mapping for Montana
Degradation of habitat by land management practices or recreation use	Increase current efforts to improve river recreation management and monitoring

	Work with other agencies to promote land management and recreational uses along riparian areas that are conducive to natural streambank stability
Contaminated runoff from agriculture in wetland and riparian areas	Work on education campaign to broaden the understanding of how activities adjacent to wetland/riparian areas are connected to their health
Road construction that disrupts hydrologic patterns	Work with department of transportation to minimize and mitigate impacts of new and existing road development including streambank stabilization
Dams, channelization, and riprap for flood and erosion control disrupting natural stream dynamics, affecting successional patterns	Work with appropriate authorities to restore or mimic natural hydrograph and dynamic nature of riparian and wetland areas
	Work with landowners or reservoir operators to provide water levels compatible with natural regimes
Draining and conversion of wetlands to agricultural cropland and subdivisions	Work with other groups to identify wetlands that are critically important to wildlife diversity and work toward protection and enhancement
	Support efforts to complete National Wetlands Inventory mapping for Montana
	Work with local governments and organizations to address loss of riparian and wetland areas associated with residential development through setbacks and other means
Cottonwood Stands	
Flood control and channelization through riprap and dams. Culverts, dams, irrigation diversions, and other instream barriers that fully or partially alter natural flood regimes (eliminates cottonwood regeneration)	Work with appropriate authorities to restore or mimic historic hydrograph to promote productive cottonwood stands in river corridors
Unsustainable harvest of older cottonwoods for lumber or pulp	Maintain and recruit old-growth trees for snags used by cavity-nesting species

References

A Landowner's Guide to Montana Wetlands. Montana Watercourse.

Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, MT.

Elis, Janet H., and Jim Richard. A planning guide for protecting Montana's wetlands and riparian areas. Montana Watercourse, Montana Department of Environmental Quality, and Montana Audubon Society.

Hansen, A., J. Rotella, L. Klass, and D. Gyskiewicz. 2003. Riparian Habitat Dynamics and Wildlife Along the Upper Yellowstone River. Technical Report #1. Landscape Biodiversity Lab, Montana State University, Bozeman, MT. In cooperation with the Governor's Upper Yellowstone River Task Force.

Kootenai Tribe of Idaho and Montana Fish, Wildlife & Parks. 2004. Public Review Draft Kootenai Subbasin Plan. Executive Summary. Report prepared for the Northwest Power and Conservation Council. Portland, OR.

Ostlie, W. R, R. E. Schneider, J. M. Aldrich, T. M. Faust, R. L. B. McKim, and S. J. Chaplin. 1997. The status of biodiversity in the Great Plains. The Nature Conservancy, Arlington, VA. 326 pp + XII.

Statewide Habitat Plan. 1994. Implementation of Fish, Wildlife & Parks Commission. Habitat Montana Policy.

Sagebrush and Salt Flats (5,625,886 acres or 5.97% of Montana)

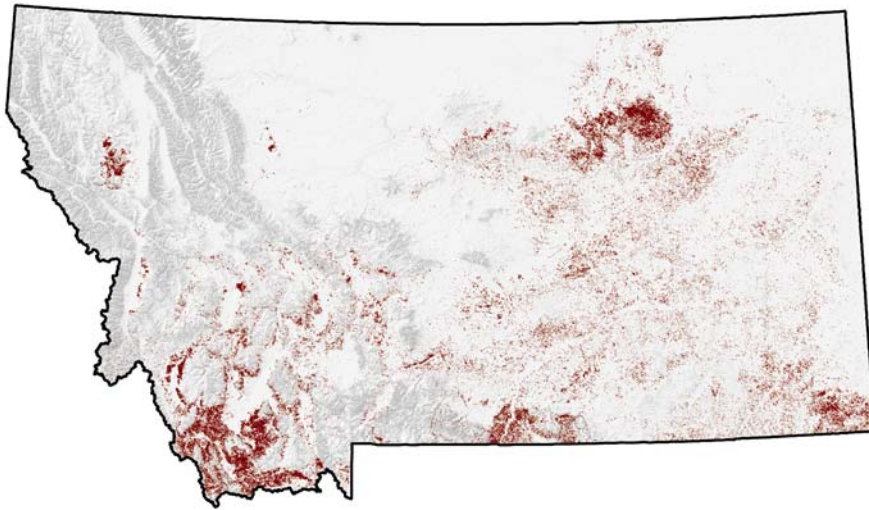


Figure 40. Distribution of Sagebrush and Salt Flats Community Types

The sagebrush community includes all sagebrush and associated grass and shrubs, although specific attention should be focused on the “shrub steppe,” a transitional zone between arid shrubland and semiarid grassland and saltsage that occurs primarily in eastern and southeastern Montana alkali flats. The community can be visualized as a mosaic of sagebrush communities that occur in discontinuous pockets throughout Montana although mostly in the eastern two thirds.

These communities occur primarily in valleys across the state. Occasionally they occur on low- to mid-elevation mountain slopes. Shrublands are dominated by sagebrush (*Artemisia* spp.), with 20 to 80 percent cover.

Essential Associated Plant Community

Basin Big Sagebrush (*Artemisia tridentata tridentata*)

Black Sagebrush Steppe (*Artemisia nova*)

Mountain Big Sage (*Artemisia tridentata vaseyana*)

Wyoming Big Sage (*Artemisia tridentata wyomingensis*)

Saltsage (*Atriplex nuttallii*)

Associated Species of Greatest Conservation Need (Tier I Species)

There are a total of 78 terrestrial vertebrate species that are found within the sagebrush and salt flats community type, with 23 of these species being essentially associated (essentially associated species are shown in bold). All associations can be found in Table 43.

Birds: Greater Sage-Grouse, Mountain Plover, Long-billed Curlew, and Burrowing Owl

Mammals: Spotted Bat, Pallid Bat, Pygmy Rabbit, Great Basin Pocket Mouse, Black-tailed Prairie Dog, and White-tailed Prairie Dog

Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
Range management practices and conversion to agriculture, which alter the distribution and condition of Montana's sagebrush habitat	Protect large blocks of healthy sagebrush through conservation easements
	Work with private landowners through landowner incentives and conservation easements to protect critical habitats
	Cooperate with government and private conservation programs/activities that encourage and support private land stewardship
	Promote grazing plans that encourage a mosaic of sagebrush, native grasses, and forbs
Invasion of weeds and woody and non-native species	Support cooperative efforts to reduce invasive and exotic plant species
	Work with off-road vehicle users to help reduce spread of invasive weeds
	Create a stable native seed source for sage restoration after fires
Loss of sagebrush as a result of human population growth/development	Support strategic conservation easements by conservation organizations and public agencies
	Support state/federal tax incentives that discourage sagebrush habitat loss
	Promote further development of county ordinances that help guide future residential and commercial development in sagebrush habitat
	Identify and prioritize key wildlife linkage areas, and work with other state and federal agencies, conservation groups, and landowners to restore wildlife connectivity

Oil, gas, and geothermal exploration and development	Monitor leasing and development decisions and regulations applying to geophysical exploration
	Work with corporations, land owners and other agencies to reduce impacts of exploration
	Conduct research on fossil fuel development and its impacts on sagebrush
Impacts from recreational use	Work with the public and other agencies to establish sustainable recreation management practices, including designations of lands open, limited, or closed to off-road vehicle use

References

Casey, D. 2000. Partners in Flight Bird Conservation Plan Montana Version 1.0. Montana Partners in Flight. Kalispell, MT.

Conservation Management of America's Public Lands: An Assessment and Recommendations for Progress 25 Years after FLPMA. 2001. National Wildlife Federation and the Natural Resources Defense Council.

Frisina, Michael R., and John J. McCarthy. 2001. Montana Sagebrush Bibliography. Montana Fish, Wildlife & Parks. 69 pp.

Ostlie, W. R, R. E. Schneider, J. M. Aldrich, T. M. Faust, R. L. B. McKim, and S. J. Chaplin. 1997. The status of biodiversity in the Great Plains. The Nature Conservancy, Arlington, VA. 326 pp + XII.

Mountain Streams (59,364 Stream Miles in Montana)

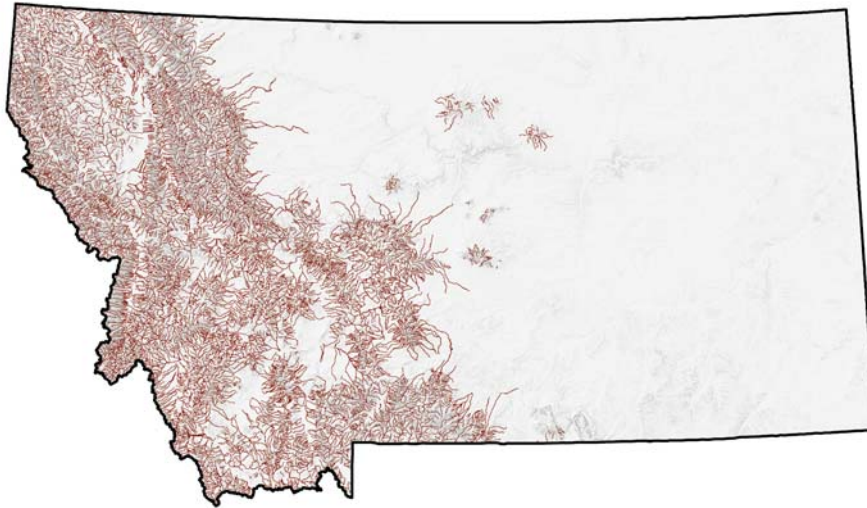


Figure 41. Distribution of Mountain Stream Community Types

Mountain streams of western and central Montana are typically cold and clear, and serve as the headwaters for all major river systems in Montana. Mountain streams often flow through montane conifer forests beginning at the highest elevations, and can range diversely from high-alpine, steep gradient reaches to low-gradient, meadow stream types (Stagliano 2005). These streams are home to abundant native fish species, which are the targets of anglers from around the country. Many of these native species are declining due to habitat degradation, dams, hybridization, overfishing, and being outcompeted by introduced salmonids. These streams support the remaining genetically pure stocks of Montana's Yellowstone and westslope cutthroat and bull trout.

Essential Associated Plant Community

This information has not been defined for the mountain stream community type.

Associated Species of Greatest Conservation Need (Tier I Species)

There are a total of 18 fish, mussel, and crayfish species that are found within the mountain streams community type, with 17 of these species being essentially associated (essentially associated species are shown in bold). All associations can be found in Table 44.

Invertebrates: **Western Pearlshell**

Fish: Yellowstone Cutthroat Trout, Westslope Cutthroat Trout, Columbia Basin Redband Trout, Bull Trout, and Arctic Grayling

Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
Riparian habitats effected by roads, housing developments, and range and forest management practices that degrade the adjacent riparian habitat and stream channel	Support government and private conservation activities that encourage and support sustainable land management practices in riparian areas
	Modification of riparian management practices such that riparian vegetation is allowed to recover
	Develop statewide riparian best management principles
	Conservation easements and cooperative efforts to address human population growth and related impacts
	Work with Department of Transportation to mitigate for impacts of new and existing roads and highways
Stream dewatering	Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph
	Protect instream flow reservations
	Increased installation of stockwater wells in place of irrigation ditches
	Increase instream flows through water leasing and water conservation measures
Entrainment of fish in irrigation diversions	Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
Stream channel alteration	Restoration of stream channels, streambanks and riparian areas to a condition that simulates their natural form and function
Introductions of non-native fishes	Programs to help control exotic species and promote natural habitats that support native species

	Protection of native species through habitat protection and enhancement, controlling and in some cases removing non-native species, and restoring or introducing native fishes into suitable waters
--	---

References

Fuller, P. L., G. Nico, and J. D. Williams. 1999. Nonindigenous fishes introduced into inland waters of the United States. American Fisheries Society, Bethesda, MD.

Marcuson, P.E. 1977. Overgrazed streambanks depress fishery production in Rock Creek, Montana, pp. 143–156. In: Proc. of the workshop on livestock and wildlife-fisheries relationships in the Great Basin. University of California, Agricultural Station, Sci. Spec. Publ. 3301, Berkeley, CA.

Platts, W. S. 1991. Livestock grazing, pp. 389–424. In: W. R. Meehan, ed. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19:389–423.

Platts, W. S. 1989. Compatibility of livestock grazing strategies with fisheries, pp. 103–110. In: R. E. Gresswell, B. A. Barton, and J. L. Kershner, eds. Practical approaches to riparian resource management. U.S. Bureau of Land Management, P.O. Box 36800, Billings, MT.

Platts, W. S. 1981b. Influence of forest and rangeland management on anadromous fish habitat in western North America: 7. Effects of livestock grazing. U.S.D.A. Forest Service General Technical Report PNW-124.

Rahel, F. J. 2002. Homogenization of freshwater faunas. Annual Review of Ecology and Systematics 33:291–315.

Rahel, F. J. 2000. Homogenization of fish faunas across the United States. Science 288:854–856.

Rahel, F. J. 1990. The hierarchical nature of community persistence: a problem of scale. American Naturalist 136:328–334.

Schulz, T. T., and W. C. Leininger. 1990. Differences in riparian vegetation structure between grazed areas and exclosures. Journal of Range Management 43:295–299.

Stagliano, D. M. 2005. Aquatic Community Classification and Ecosystem Diversity in Montana's Missouri River Watershed. Report to the Bureau of Land Management. Montana Natural Heritage Program, Helena, Montana. 65 pp. plus appendices.

Tennant, Donald. Instream Flow Regimes for Fish, Wildlife, Recreation, and Related Environmental Resources (Billings, Mont.: U.S. Fish and Wildlife Service, 1975).

Prairie Streams (91,189 Stream Miles in Montana)



Figure 42. Distribution of Prairie Stream Community Types

There are at least 18,000 miles of prairie streams in Montana that have water either intermittently or permanently flowing through them in an otherwise dry region. Eight specific types of prairie streams were delineated for Montana (Stagliano 2005). These low-elevation streams east of the Rocky Mountains are warmer than their counterparts in western Montana and support a richer and quite different variety of fish. Stagliano (2005) also documented nine fish species group assemblages (SPAs), or community associations, for the prairie stream systems. Many of these streams are slow moving and sometimes turbid and weedy, while those in the northern glaciated plains can be just as clear as a mountain stream. They offer good rearing habitat for associated fish species, support many amphibians and reptiles, and are crucial for populations of terrestrial wildlife. Please refer to Stagliano 2005 for more detailed information regarding aquatic communities in Montana's Missouri River watershed.

Essential Associated Plant Community

Wet sedge (*Carex* spp.)
Bulrush (*Scirpus* spp.)
Rushes (*Juncus* spp.)

Associated Species of Greatest Conservation Need (Tier I Species)

There are a total of 32 aquatic species that are found within the prairie stream community type, with 25 of these species being essentially associated (essentially associated species are shown in bold). All associations can be found in Table 45.

Fish: Pearl Dace

Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
Prairie stream riparian habitat effected by range management practices	Support government and private conservation activities that encourage and support sustainable land management practices
	Support all management practices that maintain riparian vegetation and streambank and channel stability in excellent condition
Stream diversions and dewatering	Implementation of various water conservation or flow management practices that restore essential habitats and simulate the natural hydrograph
	Protect instream flow reservations
	Increased installation of stockwater wells in place of irrigation ditches
	Increase instream flows through water leasing and water conservation measures
Entrainment of fish in irrigation diversions	Screening or modification of irrigation diversions or other water intakes in a manner that prevents entrainment of fishes
Poorly understood impacts of petroleum exploration and extraction	Increase research and scientific studies on impacts of coal bed methane on prairie stream environments in both Montana and Wyoming
Introductions of non-native fishes	Programs to help control exotic species and promote natural habitats that support native species
	Protection of native species through habitat protection and enhancement, controlling and in some cases removing non-native species, and restoring or introducing native fishes into suitable waters

References

- Flores, R., G. Stricker, J. Meyer, T. Doll, P. Norton, R. Livingston, and M. Jennings. 2001. A Field Conference on Impacts of Coal Bed Methane Development in the Powder River Basin, Wyoming. USGS Open File Report 01-126.
- Fuller, P. L., G. Nico, and J. D. Williams. 1999. Nonindigenous fishes introduced into inland waters of the United States. American Fisheries Society, Bethesda, MD.
- Marcuson, P. E. 1977. Overgrazed streambanks depress fishery production in Rock Creek, Montana, pp. 143–156. In: Proc. of the workshop on livestock and wildlife-fisheries relationships in the Great Basin. University of California, Agricultural Station, Sci. Spec. Publ. 3301, Berkeley, CA.
- Platts, W. S. 1991. Livestock grazing, pp. 389–424. In: W. R. Meehan, ed. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19:389–423.
- Platts, W. S. 1989. Compatibility of livestock grazing strategies with fisheries, pp. 103–110. In: R. E. Gresswell, B. A. Barton, and J. L. Kershner, eds. Practical approaches to riparian resource management. U.S. Bureau of Land Management, P.O. Box 36800, Billings, MT.
- Platts, W. S. 1981b. Influence of forest and rangeland management on anadromous fish habitat in western North America: 7. Effects of livestock grazing. U.S.D.A. Forest Service General Technical Report PNW-124.
- Rahel, F. J. 2002. Homogenization of freshwater faunas. *Annual Review of Ecology and Systematics* 33:291–315.
- Rahel, F. J. 2000. Homogenization of fish faunas across the United States. *Science* 288:854–856.
- Rahel, F. J. 1990. The hierarchical nature of community persistence: a problem of scale. *American Naturalist* 136:328–334.
- Schulz, T. T., and W. C. Leininger. 1990. Differences in riparian vegetation structure between grazed areas and exclosures. *Journal of Range Management* 43:295–299.
- Stagliano, D. M. 2005. Aquatic Community Classification and Ecosystem Diversity in Montana's Missouri River Watershed. Report to the Bureau of Land Management. Montana Natural Heritage Program, Helena, Montana. 65 pp. plus appendices.

Tennant, Donald. Instream Flow Regimes for Fish, Wildlife, Recreation, and Related Environmental Resources (Billings, Mont.: U.S. Fish and Wildlife Service, 1975).

United States Geological Survey. November 2001. Fact Sheet FS-110-01. Online: <http://pubs.usgs.gov/fs/fs-0110-01/>.

United States Geological Survey. 1988. Cumulative Potential Hydrologic Impacts of Surface Coal Mining in the Eastern Powder River Structural Basin, Northeastern Wyoming. USGS Water-Resources Investigations Report 88-4046. Prepared by L. J. Martin, D. L. Naftz, H. W. Lowham, and J. G. Rankl in cooperation with the Wyoming Department of Environmental Quality and the U.S. Office of Surface Mining, Cheyenne, WY.

Wheaton, J., and J. J. Metesh. 2002. Potential groundwater drawdown and recovery for coal bed methane development in the Powder River Basin, Montana. Montana Bureau of Mines and Geology Open File Report 458. 59 pp.